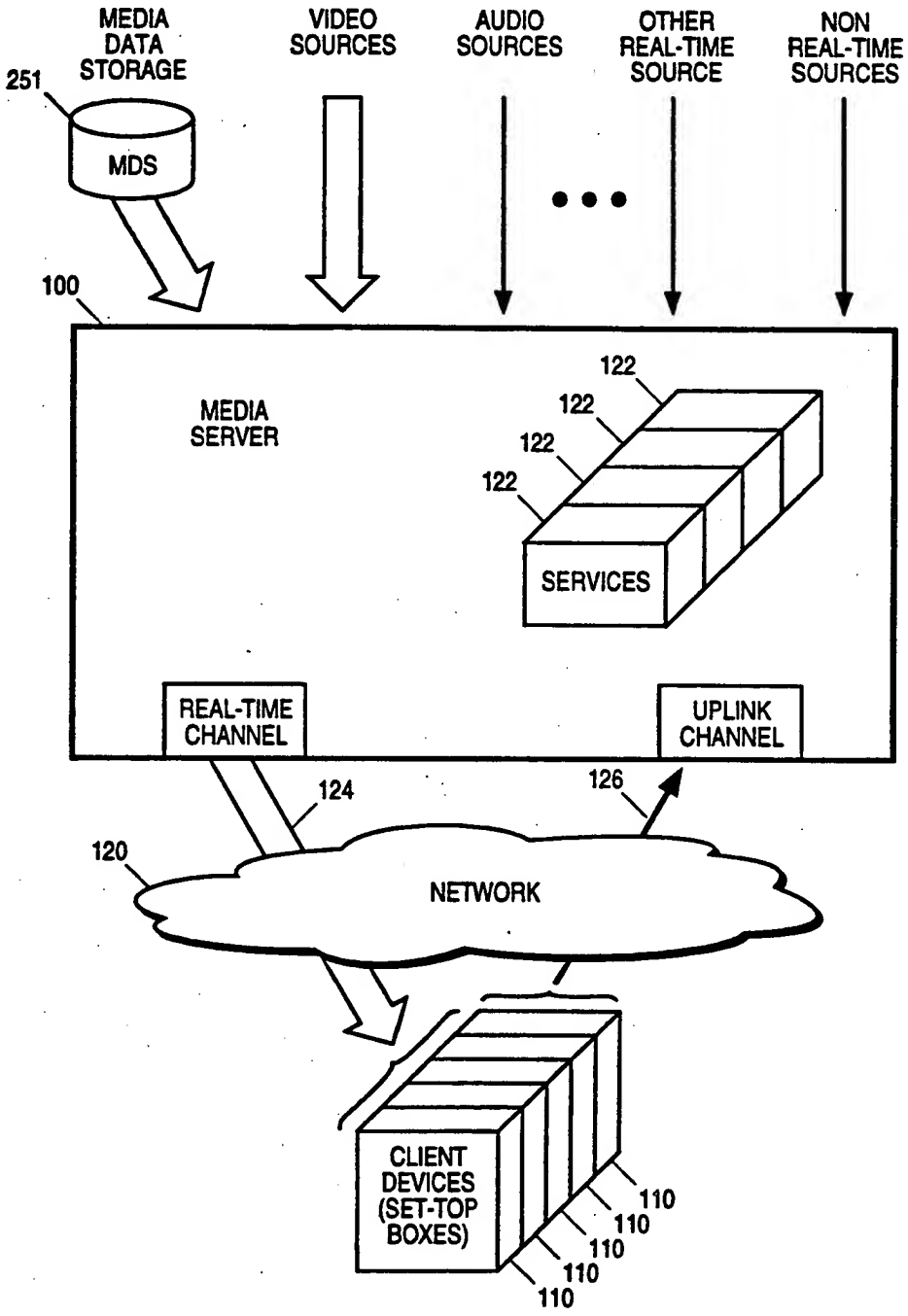
MEDIA DATA STORAGE
251
MDS
VIDEO SOURCES
AUDIO SOURCES
OTHER REAL-TIME SOURCE
NON REAL-TIME SOURCES
100
MEDIA SERVER
122
122
122
122
SERVICES
REAL-TIME CHANNEL
UPLINK CHANNEL
124
126
120
NETWORK
CLIENT DEVICES (SET-TOP BOXES)
110
110
110
110
110

FIG. 1

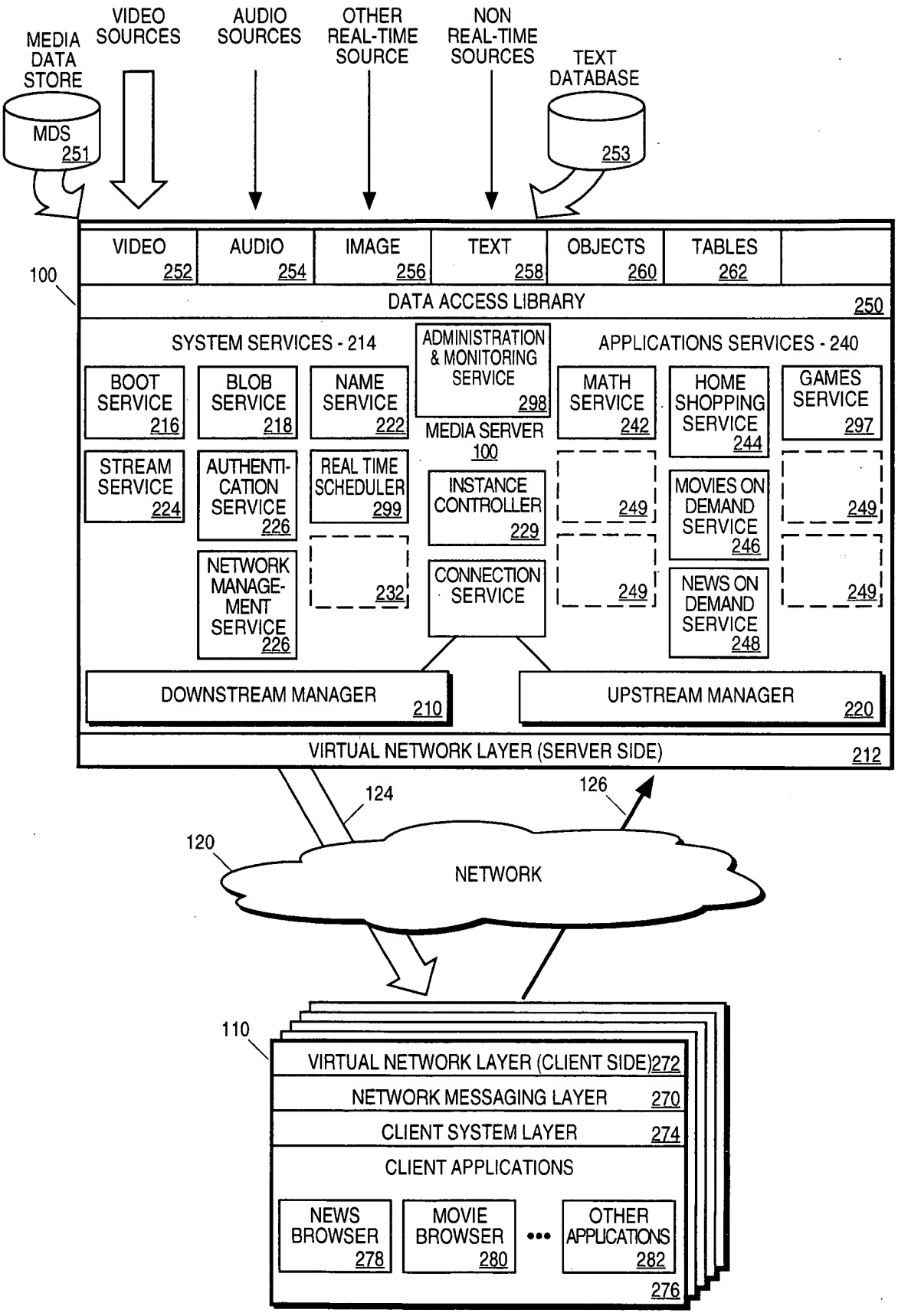
MEDIA DATA STORE
MDS 251
VIDEO SOURCES
AUDIO SOURCES
OTHER REAL-TIME SOURCE
NON REAL-TIME SOURCES
TEXT DATABASE
253
100
VIDEO 252
AUDIO 254
IMAGE 256
TEXT 258
OBJECTS 260
TABLES 262
DATA ACCESS LIBRARY 250
SYSTEM SERVICES - 214
BOOT SERVICE 216
BLOB SERVICE 218
NAME SERVICE 222
STREAM SERVICE 224
AUTHENTI-CATION SERVICE 226
REAL TIME SCHEDULER 299
NETWORK MANAGE-MENT SERVICE 226
232
ADMINISTRATION & MONITORING SERVICE 298
MEDIA SERVER 100
INSTANCE CONTROLLER 229
CONNECTION SERVICE
APPLICATIONS SERVICES - 240
MATH SERVICE 242
HOME SHOPPING SERVICE 244
GAMES SERVICE 297
249
MOVIES ON DEMAND SERVICE 246
NEWS ON DEMAND SERVICE 248
DOWNSTREAM MANAGER 210
UPSTREAM MANAGER 220
VIRTUAL NETWORK LAYER (SERVER SIDE) 212
124
126
120
NETWORK
110
VIRTUAL NETWORK LAYER (CLIENT SIDE) 272
NETWORK MESSAGING LAYER 270
CLIENT SYSTEM LAYER 274
CLIENT APPLICATIONS
NEWS BROWSER 278
MOVIE BROWSER 280
OTHER APPLICATIONS 282
276

FIG. 2

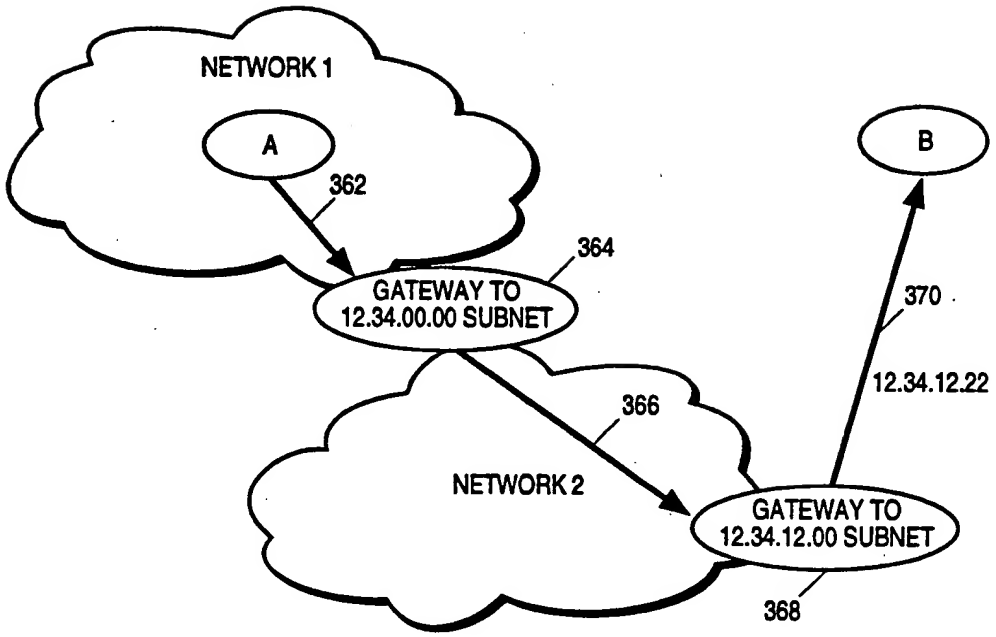
NETWORK 1
A
362
364
GATEWAY TO
12.34.00.00 SUBNET
B
370
12.34.12.22
366
NETWORK 2
GATEWAY TO
12.34.12.00 SUBNET
368

FIG. 3

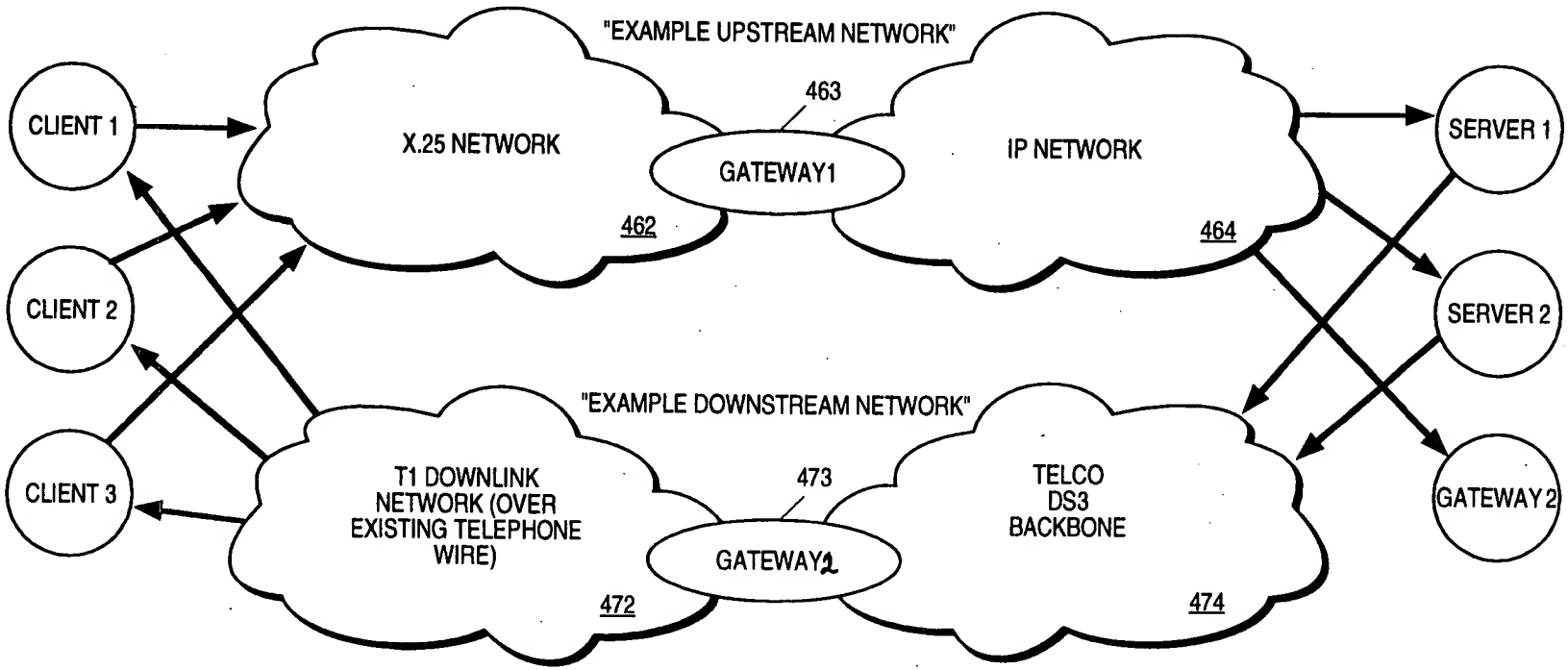

FIG. 4

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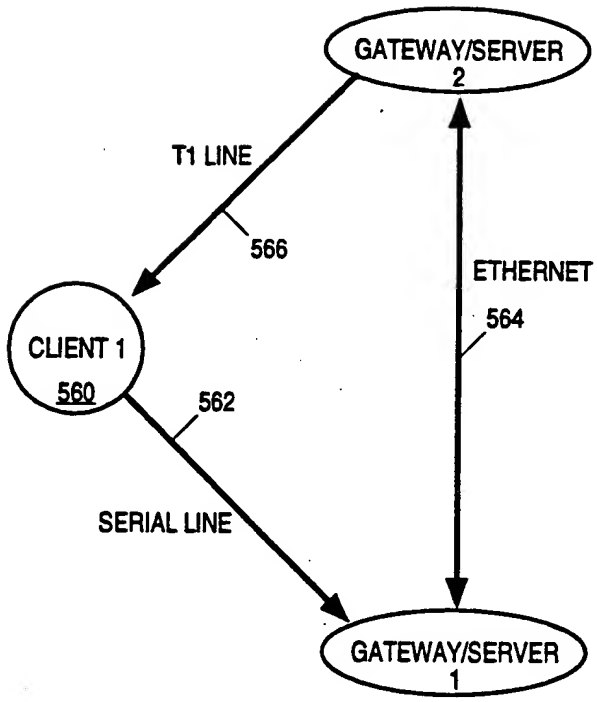
GATEWAY/SERVER
2
T1 LINE
566
ETHERNET
564
CLIENT 1
560
562
SERIAL LINE
GATEWAY/SERVER
1

FIG. 5

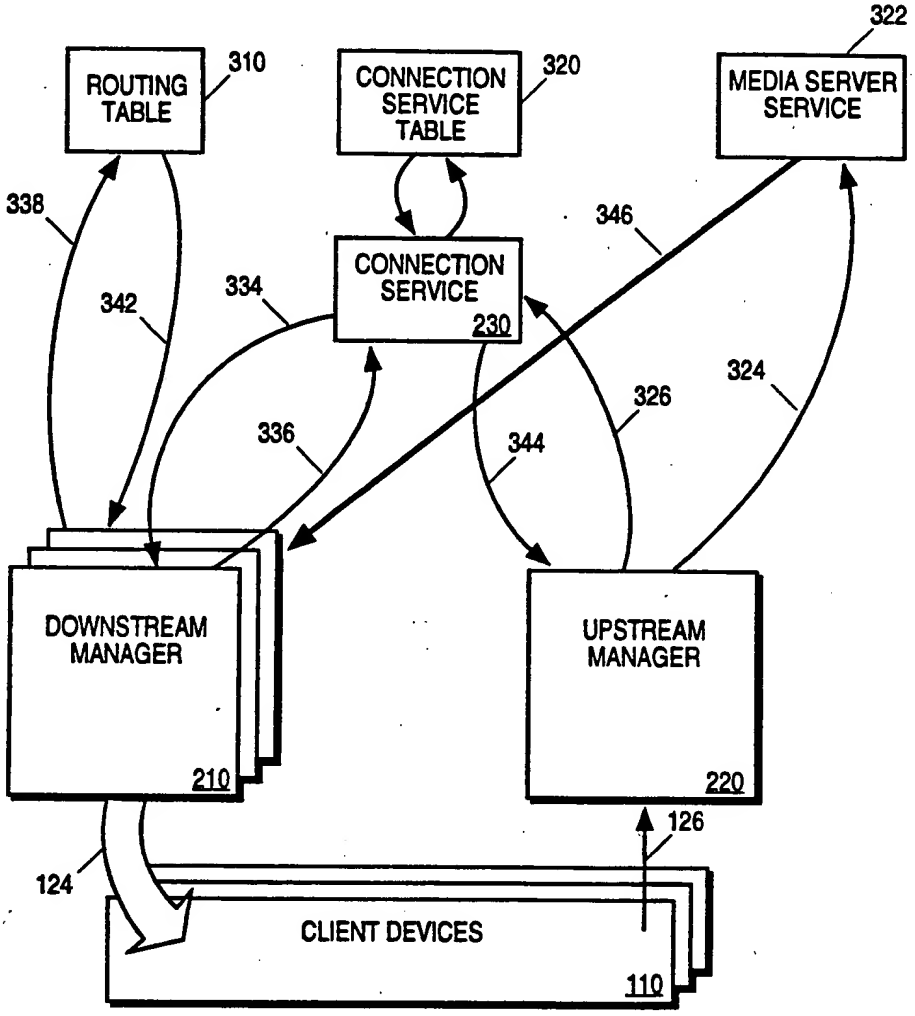
322
ROUTING TABLE
310
CONNECTION SERVICE TABLE
320
MEDIA SERVER SERVICE
338
346
CONNECTION SERVICE
230
342
334
324
326
336
344
DOWNSTREAM MANAGER
210
UPSTREAM MANAGER
220
126
124
CLIENT DEVICES
110

FIG. 6

CONNECTION SERVICE TABLE
320

UPSTREAM MANAGER PHYSICAL ADDRESS 410	CLIENT LOGICAL ADDRESS 412	DOWNSTREAM MANAGER PHYSICAL ADDRESS 414	DOWNSTREAM MANAGER LOGICAL ADDRESS 416	DOWNSTREAM CLIENT PHYSICAL ADDRESS 418

FIG. 7

ROUTING TABLE
310

DOWNSTREAM LOGICAL ADDRESS 420	DOWNSTREAM PHYSICAL ADDRESS 422

FIG. 8

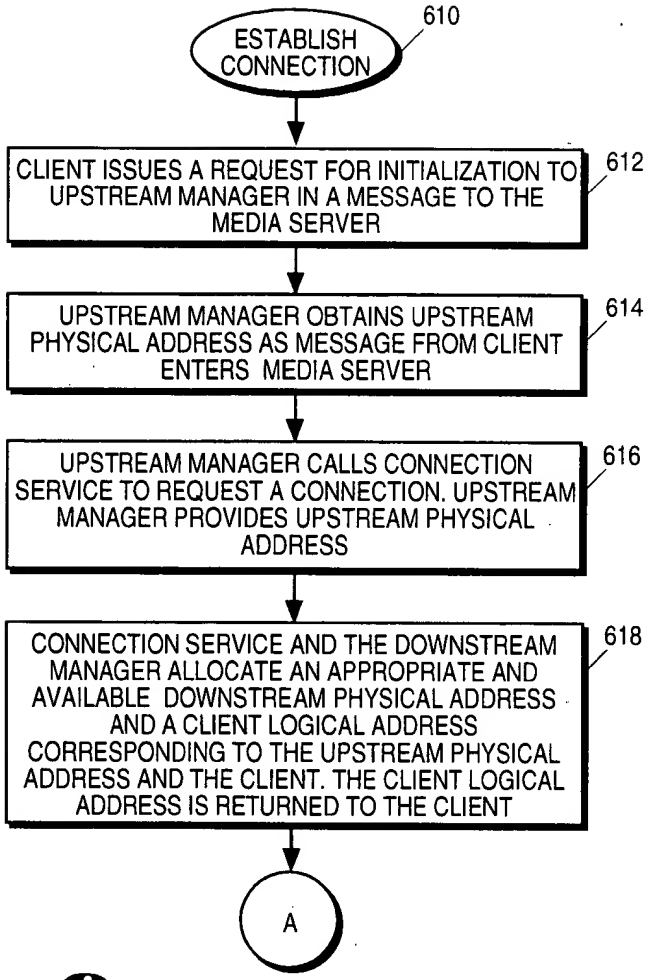
ESTABLISH CONNECTION
610
CLIENT ISSUES A REQUEST FOR INITIALIZATION TO UPSTREAM MANAGER IN A MESSAGE TO THE MEDIA SERVER
612
UPSTREAM MANAGER OBTAINS UPSTREAM PHYSICAL ADDRESS AS MESSAGE FROM CLIENT ENTERS MEDIA SERVER
614
UPSTREAM MANAGER CALLS CONNECTION SERVICE TO REQUEST A CONNECTION. UPSTREAM MANAGER PROVIDES UPSTREAM PHYSICAL ADDRESS
616
CONNECTION SERVICE AND THE DOWNSTREAM MANAGER ALLOCATE AN APPROPRIATE AND AVAILABLE DOWNSTREAM PHYSICAL ADDRESS AND A CLIENT LOGICAL ADDRESS CORRESPONDING TO THE UPSTREAM PHYSICAL ADDRESS AND THE CLIENT. THE CLIENT LOGICAL ADDRESS IS RETURNED TO THE CLIENT
618
A

FIG. 9

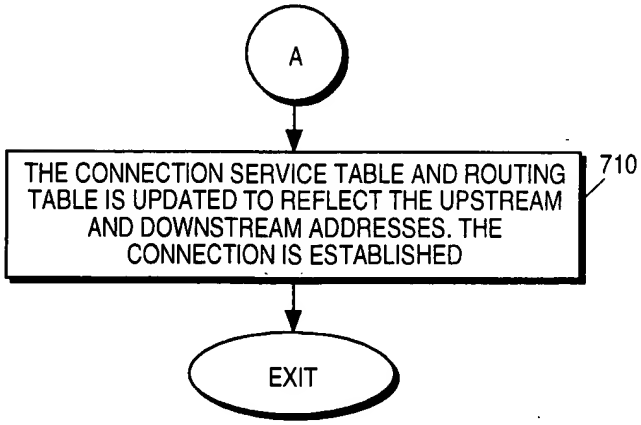
A
THE CONNECTION SERVICE TABLE AND ROUTING TABLE IS UPDATED TO REFLECT THE UPSTREAM AND DOWNSTREAM ADDRESSES. THE CONNECTION IS ESTABLISHED
710
EXIT

FIG. 10

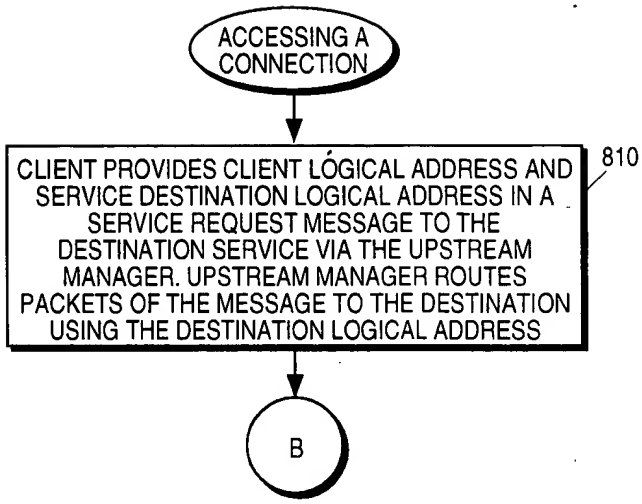
ACCESSING A CONNECTION
CLIENT PROVIDES CLIENT LOGICAL ADDRESS AND SERVICE DESTINATION LOGICAL ADDRESS IN A SERVICE REQUEST MESSAGE TO THE DESTINATION SERVICE VIA THE UPSTREAM MANAGER. UPSTREAM MANAGER ROUTES PACKETS OF THE MESSAGE TO THE DESTINATION USING THE DESTINATION LOGICAL ADDRESS
810
B

FIG. 11

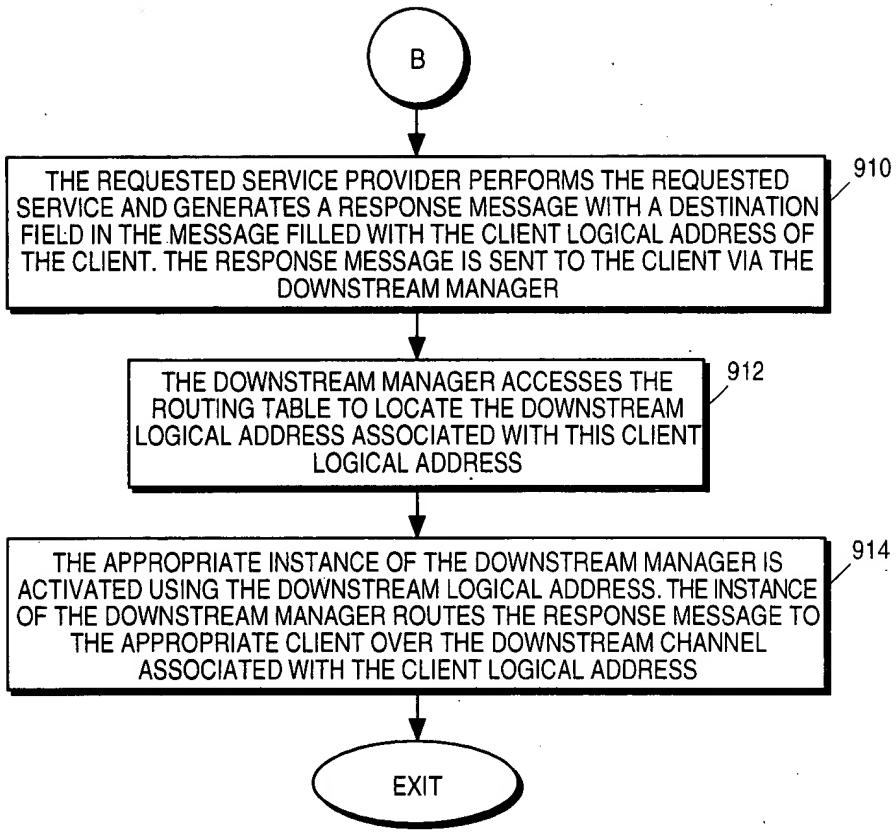
B
THE REQUESTED SERVICE PROVIDER PERFORMS THE REQUESTED SERVICE AND GENERATES A RESPONSE MESSAGE WITH A DESTINATION FIELD IN THE MESSAGE FILLED WITH THE CLIENT LOGICAL ADDRESS OF THE CLIENT. THE RESPONSE MESSAGE IS SENT TO THE CLIENT VIA THE DOWNSTREAM MANAGER
910
THE DOWNSTREAM MANAGER ACCESSES THE ROUTING TABLE TO LOCATE THE DOWNSTREAM LOGICAL ADDRESS ASSOCIATED WITH THIS CLIENT LOGICAL ADDRESS
912
THE APPROPRIATE INSTANCE OF THE DOWNSTREAM MANAGER IS ACTIVATED USING THE DOWNSTREAM LOGICAL ADDRESS. THE INSTANCE OF THE DOWNSTREAM MANAGER ROUTES THE RESPONSE MESSAGE TO THE APPROPRIATE CLIENT OVER THE DOWNSTREAM CHANNEL ASSOCIATED WITH THE CLIENT LOGICAL ADDRESS
914
EXIT

FIG. 12

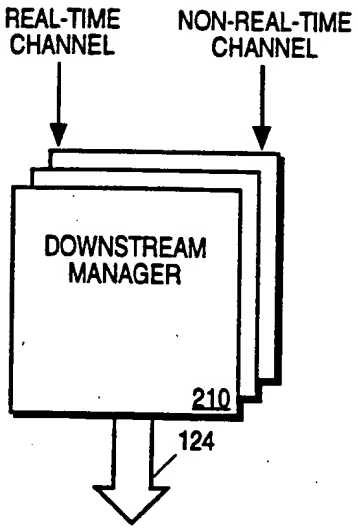
REAL-TIME CHANNEL
NON-REAL-TIME CHANNEL
DOWNSTREAM MANAGER
210
124

FIG. 13

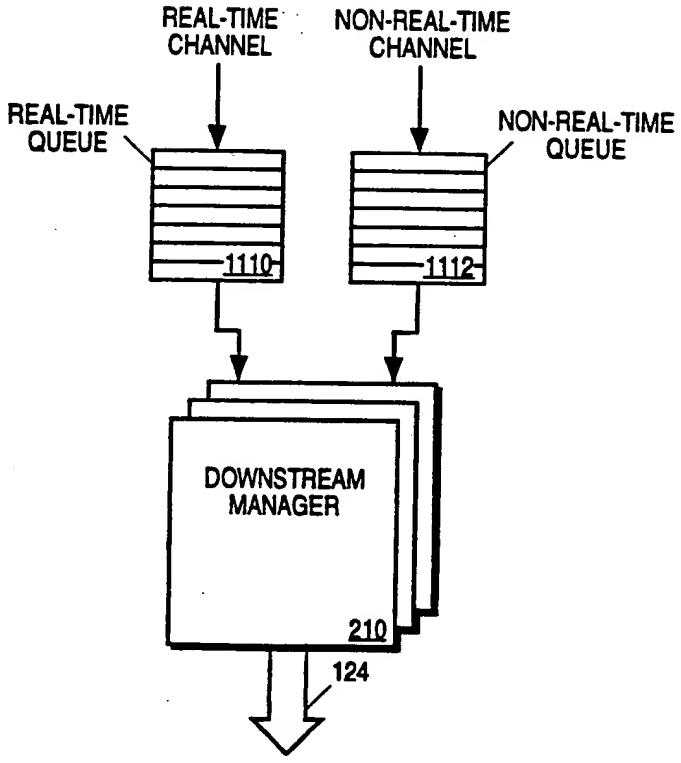
REAL-TIME CHANNEL
NON-REAL-TIME CHANNEL
REAL-TIME QUEUE
NON-REAL-TIME QUEUE
1110
1112
DOWNSTREAM MANAGER
210
124

FIG. 14

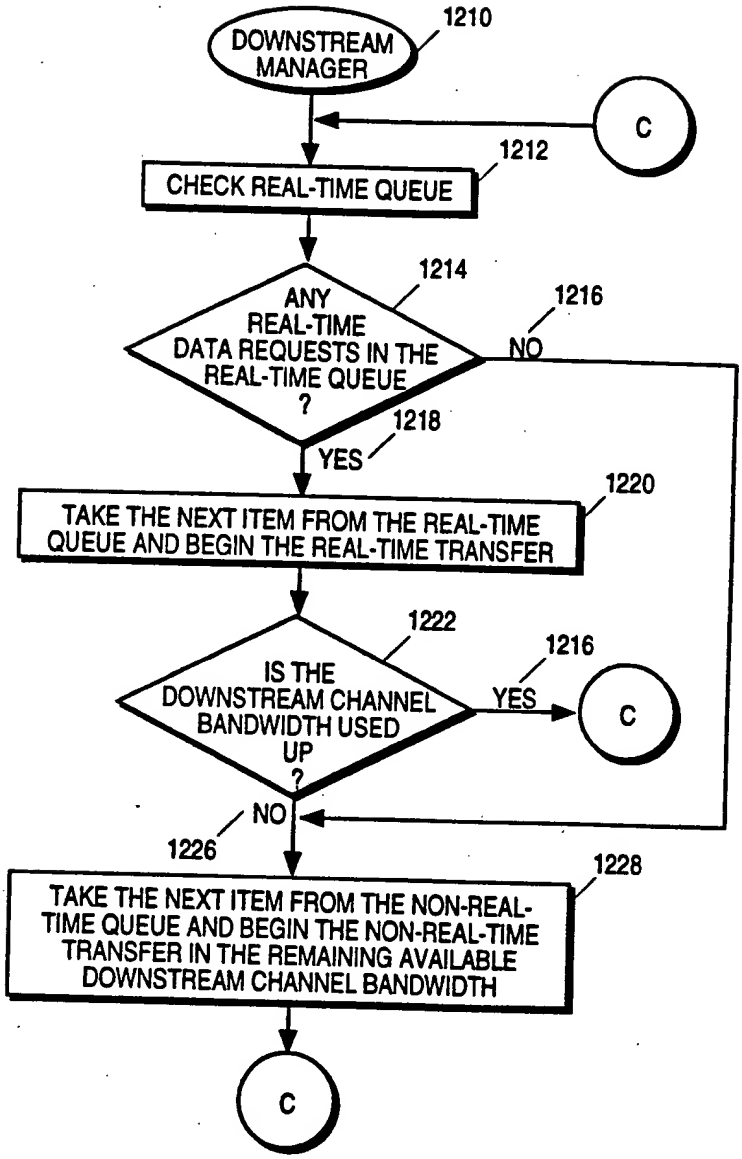
DOWNSTREAM MANAGER
1210
C
CHECK REAL-TIME QUEUE
1212
ANY REAL-TIME DATA REQUESTS IN THE REAL-TIME QUEUE ?
1214
1216
NO
YES
1218
TAKE THE NEXT ITEM FROM THE REAL-TIME QUEUE AND BEGIN THE REAL-TIME TRANSFER
1220
IS THE DOWNSTREAM CHANNEL BANDWIDTH USED UP ?
1222
1216
YES
C
NO
1226
TAKE THE NEXT ITEM FROM THE NON-REAL-TIME QUEUE AND BEGIN THE NON-REAL-TIME TRANSFER IN THE REMAINING AVAILABLE DOWNSTREAM CHANNEL BANDWIDTH
1228
C

FIG. 15

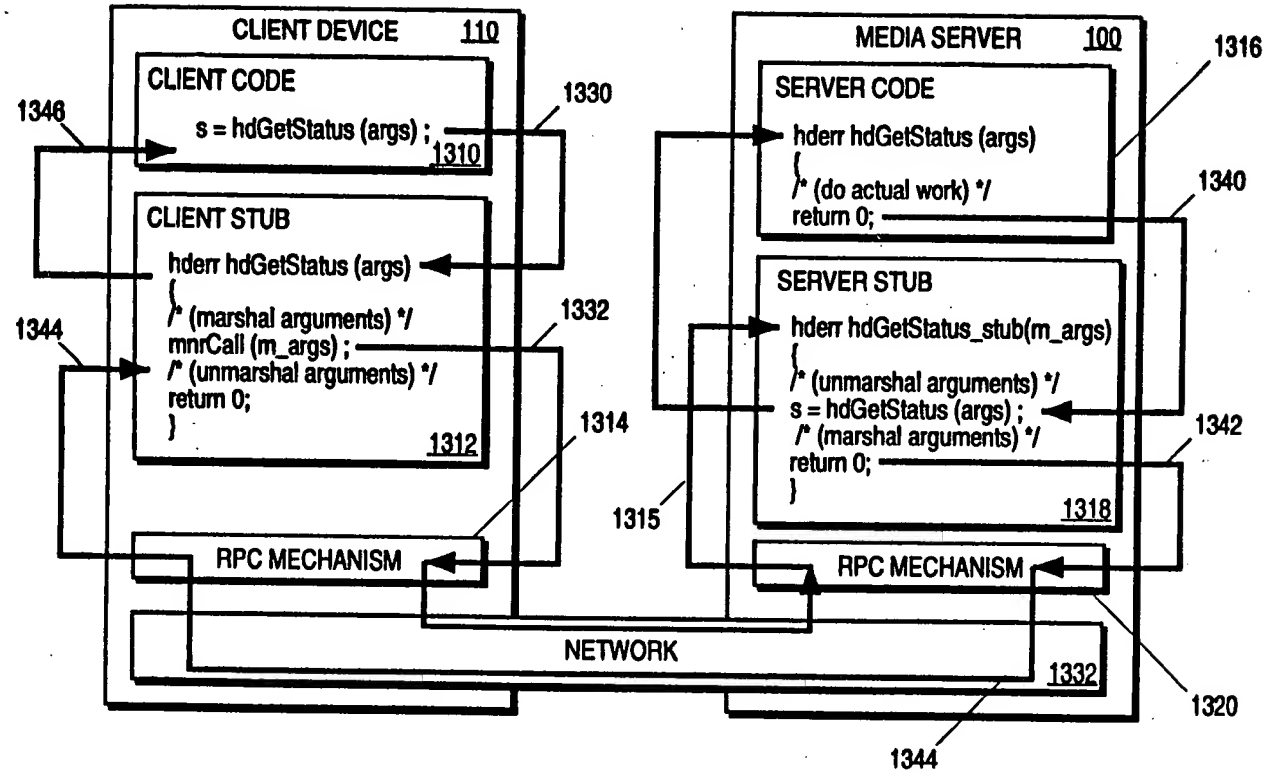

FIG. 16

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